Farmland Survey

**B**elow is a Florida scene representative of a national situation: visible in the background is a fair-sized community on what was recently highly productive farmland. A 1981 U.S. Department of Agriculture (USDA) study estimated that the nation is converting farmland to non-agricultural uses at the rate of 3 million acres a year.

Seeking reliable information on farmland loss in Florida, the state legislature—in 1984—directed establishment of a program for development of accurate data to enable intelligent legislation of state growth management. Thus was born Florida's massive Mapping and Monitoring of Agricultural Lands Project (MMALP), which was to employ data from the NASA-developed Landsat Earth resources survey satellite system as a quicker, less expensive alternative to ground surveying.

The three year project in-volved inventory of Florida's 36 million acres and county-by-county tabulation of the acreage in each land cover classification, such as crop-land, pastureland, citrus, woodland, wetland, water and populated areas. Direction of the project was as-signed to the Florida Department of Community Affairs (DCA), with assistance from the Department of Transportation (DOT), which had expertise in satellite remote sensing operations. As MMALP project director, DCA assigned Robert Groce, a resource conservationist on loan from the USDA Soil Conservation Service. At right above, Groce (stand-ing) is comparing notes with Florida DOT remote sensing specialist Jesse Day.

The utility of the Landsat system for land cover survey stems from the fact that each type of land cover emits or reflects a unique type of ra-diation that can be detected and differentiated by Landsat's sensors. Computer
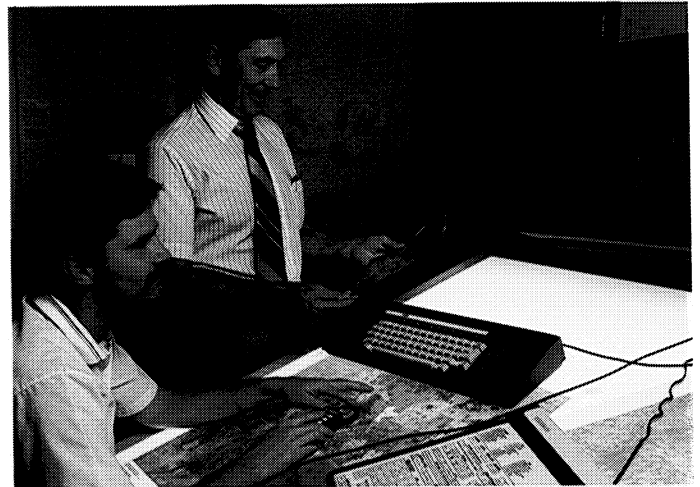

processing of Landsat data at ground facilities enables cre-ation of electronic imagery or tapes from which informa-tive resource maps can be prepared. An example of an MMALP image is shown be-low; here pastureland is highlighted in red and the other colors represent crop-land, woodland and devel-oped areas. At right center, DOT remote sensing special-ist Khaleda Hatim is using such Landsat imagery to pre-pare a land cover classifica-tion map of a segment of

Florida. Maps like these, covering all of the state's 67 counties, were prepared with 1984 data, and those maps were compared with another set of maps for the same areas developed with 1973 Landsat data, thus providing a graphic comparison of the land cover changes that had occurred over the 11-year span.

Early in the project, Groce decided that combining soil data with the Landsat land cover data would make available to land use planners
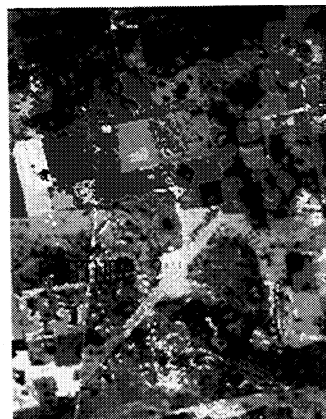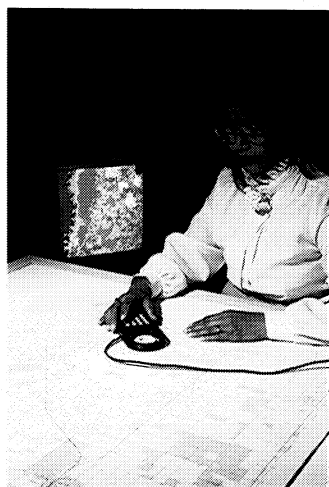
a more comprehensive view of a county's land potential. He obtained the cooperation of the USDA Soil Conservation Service, which agreed to digitize—and pay for—soil surveys for two counties, with data for the other counties to come later. At upper right, MMALP soil scientist Susan Ploetz is preparing an overlay that incorporates USDA soil data. Addition of data on soil types and characteristics allows farmers and state officials to determine whether a particular block of land has prime agricultural soil and what types of crops might be grown there; it also gives developers an overview of areas with land characteristics best suited to the needs of a planned development.

To verify the data going into the land cover maps, both USDA soil data and Landsat sensor data, the MMALP group made frequent "ground truth" tests
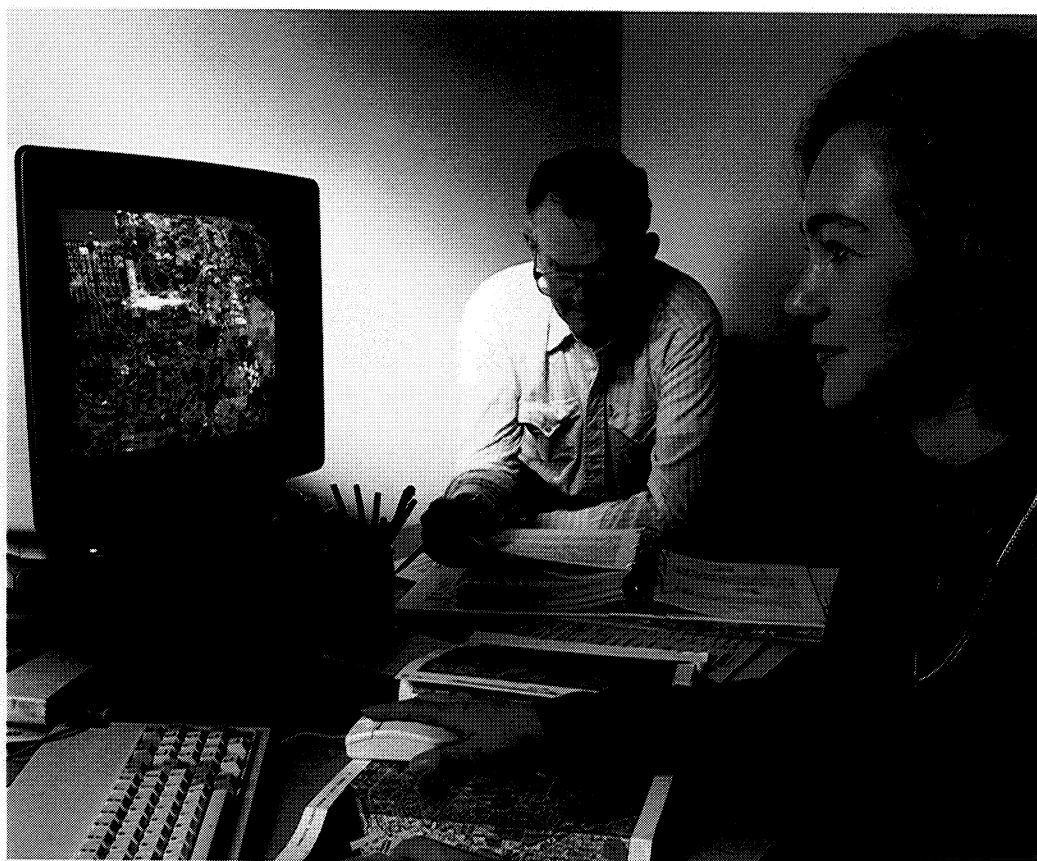
(below). This involved taking actual soil samples at a particular site or visually checking the vegetation to make sure the computer processed information was accurate. The information proved accurate.

In July 1987, Florida's DCA completed the MMALP project and later in the year submitted a report to the state legislature. It showed the agricultural land acreage for each county as of 1973 and 1984 and the percentage of loss of agricultural

land over that span. The total farmland lost to non-agricultural developments was 1,683,986 acres, or 5.6 percent. This was substantially less than had been estimated in other assessments made prior to MMALP. However, some counties showed significant losses and they will have to be monitored.

The report also detailed the acreage in each of 21 land cover classifications as of 1984. The agricultural land and total cover information, eventually to be supple-

mented by all-state soil data, built a comprehensive computerized data base that provides Florida officials an important planning tool. This was the first effort to use Landsat data for mapping an entire state and, says project director Robert Groce, "Everyone seems to be satisfied with the process and with the results." ▲